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SNYDER, ZACHARY J				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/567,258

**Applicant(s)**

DRAZIC ET AL.

**Examiner**

Zachary Snyder

**Art Unit**

2889

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/8)
- \_\_\_\_\_ Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- \_\_\_\_\_ Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

Receipt is acknowledged of applicant's amendment filed 11/16/2009. Claims 1-7 are pending and an action on the merits is as follows.

***Response to Arguments***

Applicant's arguments filed 11/16/2009 have been fully considered but they are not persuasive.

Applicant has argued that the combination of Yokoyama in view of Zimmerman further in view of Hira would not yield the claimed invention. The Applicant contends the following:

- (1) each extractor would be a microlens;
- (2) the layer of extractors would not be optically coupled to the electroluminescent layer;
- (3) There is no evidence that the distance between the organic electroluminescent layer and the extractors is less than or equal to 2 micrometers;
- (4) There is no evidence that the transparent electrode and the extractors are in direct contact.

In reply:

(1) Hira was used to teach the use of a plurality of light extractors per cell of the electroluminescent layer. Hira's type of extractor was not described in the rejection as being used in the combination of Yokoyama, Zimmerman, and Hira, just the number of extractors.

(2) In figure 11 of Hira, the light extractors 12 are optically coupled to the electroluminescent layer as film 30 is not required (COL. 16, LINE 54). In figure 2B of Zimmerman, the light extractors 10 are coupled to the electroluminescent layer 6.

(3) The layer thickness of the anode layer taught by Yokoyama is 150nm (paragraph 39) meaning that the collimating means formed on the anode would be 150 nm from the organic electroluminescent layer. The anode is the top layer of the electroluminescent layer and the only layer between the light extractor layer and the organic electroluminescent layer.

(4) The first collimating means incorporates the function of the aperture means (COL. 2, LINE 22). The aperture means is in close proximity to the light source (COL. 2, LINE 9). Proximity is defined as "in intimate physical contact" in COL. 5, LINE 38.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. PG Publication 2002/0175620 to Yokoyama et al. in view of U.S. Patent 5,598,291 to Zimmerman et al. further in view of U.S. Patent 6,633,351 B2 to Hira et al.

In regard to claim 1, Yokoyama teaches in figure 3, a lighting or image display panel comprising a substrate carrying:

an electroluminescent organic layer (organic light emitting layer 15, paragraph 40) partitioned into electroluminescent regions and inserted between two electrode layers (anode 11 and cathode 41, paragraph 48) of which one is transparent (transparent anode layer, paragraph 48) and the other opaque (cathode layer 41 made of a metallic thin film, paragraph 48),

an array of light emitting cells, wherein each cell comprises one of said electroluminescent regions and corresponds to a crossing region of one electrode of each electrode layer (shown in figure 3).

Yokoyama does not teach about a plurality of light extractors corresponding to each cell (pixel) of the display device.

Zimmerman teaches in figure 2B a layer of light extractors (collimating means 10) operating by reflection (sides are reflective, COL. 7, LINE 11), each extractor being made from transparent material (input end 32 remains transparent, COL. 7, LINE 12) and being bounded by a light entry interface optically coupled to the electroluminescent layer via the said transparent electrode layer (formed in optical contact with light generating means 6, which corresponds to the display device taught by Yokoyama, therefore the light extractors would be formed on Yokoyama' transparent anode 11), by a light exit interface directed towards the outside of the display panel (light output surface 34), and by side walls forming reflecting optical interfaces for the light propagating within the extractor and forming a closed reflecting surface (sides 33), where the electroluminescent layer region of each cell is flat (shown by Yokoyama in figure 3), is optically coupled to the extractors (formed in optical contact with light generating means 6, which corresponds to the display device taught by Yokoyama, therefore the light extractors would be formed on Yokoyama' transparent anode 11), wherein, for each extractor, the surface of said light exit interface is superior to the surface of said light entry interface (the exit interface is higher than the entry interface).

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Yokoyama and Zimmerman before him or her, to modify the display device of Yokoyama to comprise light extractors as taught by Zimmerman in order to collimate the light emission and have a bright and uniform light source (COL. 2, LINES 25-29).

Zimmerman does not teach that a plurality of extractors corresponds to each cell and wherein said plurality of extractors is numerous enough to allow extractor alignment constraints with the cells to be reduced.

Hira teaches a display device with cells (pixels 22) wherein a plurality of extractors (part 2 of optical functionality sheet 12) correspond to each cell (pixel 22). As shown in figure 11, the box designating pixel 22 has multiple extractors above it. Additionally, extractors 2 are smaller than pixel 22 (COL. 16, LINES 60-65). Due to the small size of the extractors, the need for precise placement of the extractors is reduced.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Yokoyama, Zimmerman, and Hira before him or her, to modify the display device of Yokoyama and Zimmerman to comprise a plurality of light extractors per cell as taught Hira in order to increase the effect of light enhancement by having more light extractors per cell.

In regard to claim 2, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 1. Zimmerman also teaches in figure 2B that the light extractors are formed on the light emitting layer. The layer thickness of the anode layer taught by Yokoyama is 150nm (paragraph 39) meaning that the collimating means formed on the anode would be 150 nm from the organic electroluminescent layer. Motivation to combine would be the same as stated in the rejection of Claim 1 above.

In regard to claim 3, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 1.

Hira teaches that the light extractors 2 have a size smaller than that of the cells 22 (COL. 16, LINES 60-65) but not specifically that the plurality extractors is over one hundred extractors.

At the time of the invention, it would have been obvious to one of ordinary skill in the art, having the teachings of Yokoyama, Zimmerman, and Hira before him or her, to modify the display device of Yokoyama and Zimmerman to comprise a plurality of extractors per cell as taught Hira in order to increase the effect of light enhancement by having more light extractors per cell. It would also be obvious to one of ordinary skill in the art that a large number of extractors, such as over 100 extractors per pixel, would further amplify this effect.

In regard to claim 4, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 1.

Yokoyama also teaches a bottom emitting EL device. It would be obvious to one of ordinary skill in the art that these teachings could also apply to a top emitting EL device. In a top emitting EL device, the transparent anode 11 would be positioned above the organic layer 15 and on the opposite side of substrate 10. It would be obvious to one of ordinary skill in the art at the time the invention was made that an obvious design alternative to a bottom emitting EL device is a top emitting EL device. The alternative EL device structure is chosen in response to its intended application.

In regard to claim 5, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 4.

Zimmerman teaches in figure 2b the formation of a light extracting layer on the light source of a display device as discussed in regard to claim 1. Since the light extracting layers



taught by Zimmerman cover the upper surface of the display device taught by Yokoyama, it will be encapsulating the display device.

Motivation to combine would be the same as stated in the rejection of Claim 1 above.

In regard to claim 6, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 4.

Zimmerman teaches in figure 2b the formation of a light extracting layer on the light source of a display device as discussed in regard to claim 1. Since in the light source taught by Yokoyama, the transparent electrode layer is the top layer, the light extractors taught by Zimmerman would be formed directly onto the transparent electrode layer.

Motivation to combine would be the same as stated in the rejection of Claim 1 above.

In regard to claim 7, Yokoyama in view of Zimmerman and Hira teach the limitations of claim 1. Yokoyama teaches that the electrode 41 is a thin, metallic electrode (paragraph 48) but does not explicitly state that the electrode is reflecting. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the electrode 41 reflective so that the majority of generated light is transmitted out of the transparent electrode 11 and not lost.

### ***Conclusion***

Applicant's amendment 11/16/2009 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Snyder whose telephone number is (571)270-5291. The examiner can normally be reached on Monday through Friday, 9:30AM to 6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Toan Ton/  
Supervisory Patent Examiner, Art Unit 2889

/Zachary Snyder/  
Examiner, Art Unit 2889